REMARKS

Claim 1 has been amended to be directed to a signal monitoring and integrity checking system for use in a Dense Wavelength Division Multiplexing (DWDM) network. Claim 1 has been amended to recite: an optical network including a first asynchronous cross-connect and a second asynchronous cross-connect, each for connecting an incoming link to an interconnecting link; a first performance monitor for the first asynchronous cross-connect; a second performance monitor for the second asynchronous cross-connect; at least one first multi-cast means for multi-casting the input of the first asynchronous cross-connect to at least one first monitor port on the first asynchronous cross-connect; and at least one second multi-cast means for multi-casting the input of the second asynchronous cross-connect to at least one second monitor port on the second asynchronous cross-connect. The performance monitor is provided for detecting protocol and determining an error rate in accordance with the protocol. Further claim 1 has been amended to recite a subsystem including at least one comparison system for comparing the outputs from the performance monitors to detect where performance impairment is introduced.

Claim 2 has been cancelled without prejudice. Claim 3 has been amended to depend on claim 1 and to replace "to signal" with "for signaling". Claim 4 has been amended to reflect the changes of claim 1 and to depend on claim 1.

Claim 5 has been amended to add changes corresponding to those of claim 1. Claim 6 has been amended to reflect the changes of claim 5 and to recite detecting the line code of a connection to determine the protocol.

The amendment to the claims is fully supported by the application as originally filed. In particular, support for the amendment to claims 1 and 5 can be found, for example, on page 1, lines 11 to 12, page 3, lines 11 to 15, page 4, line 28 and page 6, line 3 to 5 and Figure 3; support for the amendment to claim 6 can be found, for example, on page 6, lines 18 to 21. No new matter has been introduced by way of the amendment.

The Examiner rejected claims 1 and 2 under 35 U.S.C. 103(a) as being unpatetable over Medard et al. (U.S. Patent No. 6,603,112), hereinafter referred to as Medard in view of Murthy et al. (U.S. Patent No. 6,545,982), hereinafter referred to as Murthy and Ames et al. (U.S. Patent Application Publication No. US2003/0002108A1), hereafter referred to as Ames and Devon (U.S. Patent No. 5,546,211). The Examiner rejected claims 3 and 4 under 35 U.S.C. 103(a) as being unpatentable over Medard in view of Murthy and Ames and Devon, and in further view of Fatehi et al. (U.S. Patent No. 6,185, 021), hereafter referred to as Fatehi.

Claim 1 has been amended. Claim 2 has been cancelled without prejudice. Claims 3 and 4 depend on claim 1.

The present application addresses the problem of introducing errors into data by a cross-connect complex in a Dense Wavelength Division Multiplexing (DWDM) network. The specification of page 2, lines 10-13 states: "The very nature of the optical path, carrying unknown bit-rate data of unknown protocol, presents problems in managing optical networks. In particular, if a certain cross-connect element, such as a cross-point, is introducing errors into the data being carried it is very difficult to determine that it is not functioning correctly so that corrective measures can be taken".

According to claim 1, a system includes an optical network having first and second asynchronous cross-connects, a first performance monitor for the first cross-connect, a second performance monitor for the second cross-connect, and a subsystem. For each cross-connect, at least one multi-cast means is provided to multi-caste the input of the cross-connect to at least one monitor port. The first (second) performance monitor is provided for detecting protocol and for determining an error rate in accordance with the protocol. The subsystem includes a comparison system for comparing the outputs of the performance monitors to detect where performance impairment is introduced.

By contrast, Medard discloses a system for comparing the input (16) and the output (18) of an optical device (14). The system of Medard detects malfunctions at the "physical layer", i.e. the Layer 1 of the International Standards Organization (ISO) protocol stack across network elements. Medrad fails to suggest or teach detecting protocols at Layer 2 and higher, and then determining an error rate in accordance with the protocol. Col. 5 lines 3 to 6 of Medard states: "In particular, malfunction detection is achieved by determining whether or not a function of the input and output signals conforms to an a priori known set of parameters." This is associated with comparing the actual modulated light waves rather than the partially demodulated signals carried thereon. Medard does not address the problem of introducing errors into data by an asynchronous cross-connect complex in a DWDM network.

Murthy discloses a bridge 1 and a monitoring device 9. The bridge 1 has a monitoring port 10 to which packets associated with the monitored port 3 will be forwarded. The monitoring device 9 is attached to the monitoring port 10 and analyzes packets (col. 18, lines 25 to 27). It is respectfully submitted that the switching in Murthy is performed using addressable memory elements, rather than using an asynchronous cross-connect with multiplexing as in the present application. Murthy does not address the problem of introducing errors into data by an asynchronous cross-connect in a DWDM network.

Ames discloses a data rate detector 140. The detector 140 detects the rate of transmission of the optical data input 114 and provides a signal output 138 (paragraph [0026]). The object of Ames is to overcome the multiplicity of control signals and complexity of clock recovery (paragraph [0007]).

Devon discloses a digital logic circuit 212 for selecting a protocol and decoding a signal according to the selected protocol (col. 5, lines 45 to col. 6, line 35). Devon merely discloses a protocol selection method.

Medard, Murthy, Ames and Devon neither suggest nor teach detecting where performance impairment is introduced in a DWDM network by monitoring each asynchronous cross-connect.

With respect to claims 3 and 4, the Examiner stated: "Fatehi discloses a system of monitoring a switching system that is connected to a [sic] Operation, Administration, Maintenance and Provisioning (OAM&P) system".

It is respectfully submitted that Fatehi merely uses the same term "OAM&P" as that of claim 4. Fatehi discloses a plurality of converters for converting optical signals to electrical signals, and an electronic space switch for cross-connecting the electrical signals. Col. 3, lines 65 to col. 4, line 4 of Fatehi states: "A cross-connect controller 350 is coupled to electronic space switch fabric 320 for controlling the connectivity between the input and output ports. A system controller 360 is coupled to controller 350 for supervising the operations of controller 350, for controlling the traffic to and from array 300 and for monitoring the performance of electronic space switch fabric 320". Then, col. 4, lines 23 to 26 of Fatehi states: "System controller 360 communicates with an Operation, Administration, Maintenance and Provisioning ("OAM&P") system". The OAM&P of Fatehi is for monitoring the performance of an electronic space switch fabric and not for the performance of an optical network including a plurality of asynchronous cross-connects.

Any of the cited references taken alone or in combination thereof neither suggests nor teaches the subject matter defined by claim 1 and its dependent claims 3 and 4.

The Examiner rejected claim 6 under 35 U.S.C. 103(a) over Medard in view of Murthy and Fatehi. The Examiner rejected claim 6 under 35 U.S.C. 103(a) over Medard in view of Murthy and Fatehi and in further view of Goodman et al. (U.S. Patent No. 6,636,529), hereinafter referred to as Goodman and Devon.

Claim 5 is a method claim corresponding to claim 1, and further recites at OAM&P sub-system, detecting where performance impairment is introduced. The argument described above is applied to the rejection of claim 5.

With respect to claim 6, Goodman discloses an interface for converting an incoming digital signal into a format for transmission on a synchronous digital network (col. 7, lines 8 to 20, col. 14, lines 24 to 26). Goodman uses a linecode recognition and mapping block 330 for recognizing the linecode of the incoming digital signal and performing mapping ready for inserting the signal into the synchronous digital output signal (col. 9, lines 17 to 23). Goodman merely discloses a signal conversion.

As described above, any of the cited references, Medard, Murthy and Fatehi, taken alone or in combination thereof neither suggest nor teach the subject matter of claims 1 and 5. Claim 6 depends on claim 5. Goodman does not add any teaching to Medard, Murthy and Fatehi to render claim 6 unpatentable.

It is respectfully submitted that claims 5 to 6 are patentable in view of the cited references. Applicant respectfully requests the Examiner to withdraw the rejections.

In view of the above amendments and remarks and having dealt with all the objections raised by the Examiner, reconsideration and allowance of the application is courteously requested.

Respectfully submitted,

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